DEL

CONTROL DATA
CORPORATION

CONTROL DATA®
CYBER 70
COMPUTER SYSTEMS
MODELS 72, 73, 74, 76
7600 COMPUTER SYSTEM
6000 COMPUTER SYSTEMS

COBOL INSTANT
MODELS 72, 73, 74 VERSION 4
MODEL 76 VERSION 1
7600 VERSION 1
6000 VERSION 4

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New features, as well as changes, deletions, and additions to information in this manual are indicated by bars in the margins or by a dot near the page number if the entire page is affected. A bar by the page number indicates pagination rather than content has changed.

REVISION RECORD

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CONTROL DATA CYBER 70, 6000 SERIES, 7600 COBOL

The COBOL language is designed to simplify the programming of business data processing operations; it produces easily modifiable source programs that result in shorter program development time and low program conversion costs. COBOL source and object programs run under the control of the SCOPE operating system.

This version of COBOL is designed for the CONTROL DATA® CYBER 70, 6000 Series and 7600 computers. It is upwards compatible with the COBOL developed by the American National Standards Institute (ANSI). This version provides many features in addition to all ANSI features.

ANSI formats are printed in black.

Extensions to ANSI are printed in color:

blue	All CDC extensions
green	CDC 6000 Series and CDC CYBER 70/Models 72, 73, 74
red	CDC 7600 and CDC CYBER 70/Model 76

Special Features:

Mass storage input and output including indexed sequential and direct access file processing.

SORT verb sorts files within COBOL program

Automatic table search using index names and the SEARCH and SET statements

Report Writer produces printed reports automatically, or user may produce report page with LINAGE clause and WRITE statement

Full arithmetic facility including:
- 18-digit operands
- DIVIDE with REMAINDER
- COMPUTE with exponentiation
- CORRESPONDING option with ADD and SUBTRACT

Segmentation and overlay of object program

Inter-program communication with separately compiled COBOL programs as well as with FORTRAN or COMPASS programs

Access to COBOL source library

Memory dumps with restart at specified checkpoints

Remote interactive capability for remote terminal input/output

PROGRAM EFFICIENCY HINTS

To reduce keypunching:

Use abbreviations where permitted.

Use PIC clause rather than SIZE, CLASS, USAGE clauses.

To increase compilation efficiency:

Restrict data and paragraph names to 9 characters or less.

Eliminate unnecessary paragraph names.

Reduce forward references.

To increase execution efficiency:

Use same size sending and receiving fields.

Make table and item sizes a multiple of 10 characters.

Reduce subscripting.

Subscript with literals instead of variables.

Use COMPUTATIONAL-1 items or index-names as subscripts.

Use COMPUTATIONAL-1 items as arithmetic variables.

Restrict arithmetic items to 9 digits or less.

Use SYNCHRONIZED RIGHT clause for data frequently referenced.

Use SAME RECORD AREA to save moves; SAME AREA to save space.

COBOL NOTATION

[ ] Enclosed elements are optional.

{ } Only one element must be selected.

. . . Repeat preceding bracketed material as needed.

{ } . . . Entire phrase may be repeated.

COBOL words have preassigned meanings and appear in capitals.

COBOL words not underlined may be omitted.

Terms in small letters are words supplied by the programmer.

Punctuation and special characters are required where shown.

COBOL LANGUAGE ELEMENTS

Word	Sequence of up to 30 alphanumeric characters including embedded hyphens
Identifier	Word that may be qualified or subscripted
Literal	String of characters whose value is exactly represented by the characters; numeric literal may be 0–9, +, –, and decimal point; non-numeric literal must be enclosed in quotes, may be any alphanumeric character except quotes
Statement	Procedure Division verb with associated options
Sentence	One or more statements terminated by period
Paragraph	Procedure Division sentences, Identification and Environment Division entries introduced by paragraph name, terminated by period.
Paragraph Name	Word terminated by period used to introduce paragraph; user defined in Procedure Division, pre-defined in Identification and Environment Divisions
Section	Paragraphs may be included in sections introduced by section name
Section Name	Word followed by SECTION and terminated by period; user defined in Procedure Division, pre-defined in Identification, Environment, and Data Divisions
Entry	Unit of description in Data Division, must be terminated by period

IDENTIFICATION DIVISION

```
{ ID             }
{ IDENTIFICATION } DIVISION
    PROGRAM-ID. program-name.
    [AUTHOR. [comment-entry.] ]
    [INSTALLATION. [comment-entry.] ]
    [DATE-WRITTEN. [comment-entry.] ]
    [DATE-COMPILED. [current-date supplied by compiler.] ]
    [SECURITY. [comment-entry.] ]
    [REMARKS. [comment-entry.] ]
```

ENVIRONMENT DIVISION

```
ENVIRONMENT DIVISION.
CONFIGURATION SECTION.
```

format 1:

```
SOURCE-COMPUTER. COPY library-name

 [              { literal-1    }      { literal-2    }
 [ REPLACING    { word-1       }  BY  { word-2       }
 [              { identifier-1 }      { identifier-2 }

                [ { literal-3    }      { literal-4    } ]     ]
                [ { word-3       }  BY  { word-4       } ] ... ] .
                [ { identifier-3 }      { identifier-4 } ]     ]
```

format 2:

```
SOURCE-COMPUTER. computer-name.
```

format 1:

```
OBJECT-COMPUTER. COPY library-name

 [              { literal-1    }      { literal-2    }
 [ REPLACING    { word-1       }  BY  { word-2       }
 [              { identifier-1 }      { identifier-2 }

                [ { literal-3    }      { literal-4    } ]     ]
                [ { word-3       }  BY  { word-4       } ] ... ] .
                [ { identifier-3 }      { identifier-4 } ]     ]
```

format 2:

```
OBJECT-COMPUTER. computer-name

    [SEGMENT-LIMIT IS priority-number]

    [                        { WORDS      } ]
    [ MEMORY SIZE integer    { CHARACTERS } ] .
    [                        { MODULES    } ]
```

format 1:

```
SPECIAL-NAMES. COPY library-name

    [              { literal-1    }      { literal-2    }
    [ REPLACING    { word-1       }  BY  { word-2       }
    [              { identifier-1 }      { identifier-2 }

                   [ { literal-3    }      { literal-4    } ]     ]
                   [ { word-3       }  BY  { word-4       } ] ... ] .
                   [ { identifier-3 }      { identifier-4 } ]     ]
```

format 2:

```
SPECIAL-NAMES

    [SWITCH integer-1                                                   ]
    [   { IS mnemonic-name-1                                 }          ]
    [   {    [ON STATUS IS condition-name-1                  }          ]
    [   {    [OFF STATUS IS condition-name-2] ]              }          ]
    [   { IS mnemonic-name-2                                 }          ]
    [   {    [OFF STATUS IS condition-name-3                 }          ]
    [   {    [ON STATUS IS condition-name-4] ]               }   ...    ] .
    [   { ON STATUS IS condition-name-5                      }          ]
    [   {    [OFF STATUS IS condition-name-6]                }          ]
    [   { OFF STATUS IS condition-name-7                     }          ]
    [   {    [ON STATUS IS condition-name-8]                 }          ]

    [non-numeric-literal IS mnemonic-name-1] ...

    [implementor-name IS mnemonic-name-1] ...

    [CURRENCY SIGN IS literal]

    [DECIMAL-POINT IS COMMA]

    [CONSOLE IS mnemonic-name]

    [TERMINAL IS mnemonic-name] .
```

INPUT-OUTPUT SECTION.

format 1:

```
FILE-CONTROL.  COPY library-name

 [                 ( literal-1     )        ( literal-2      )
 [  REPLACING     <  word-1         >   BY <  word-2          >
 [                 ( identifier-1  )        ( identifier-2   )

                [ ( literal-3     )        ( literal-4      ) ]    ]
                [<  word-3         >   BY <  word-4          >] ...]  .
                [ ( identifier-3  )        ( identifier-4   ) ]    ]
```

format 2:

```
FILE-CONTROL.

{  SELECT [OPTIONAL] file-name-1 [RENAMING file-name-2]

   ASSIGN TO [integer] implementor-name-1 [implementor-name-2]

   ... [OR implementor-name-3 [implementor-name-4] ...]

   [  FOR MULTIPLE  { REEL }  ]
   [                { UNIT }  ]

   [ERROR FILE IS file-name]

   [RESERVE { NO      }  ALTERNATE  [ { AREA  } ]]
   [        { integer }             [ { AREAS } ]]

   { FILE-LIMIT IS     }  { data-name-1 }
   { FILE-LIMITS ARE   }  { literal-1   }
    [ { THRU    }  { data-name-2 }                                            ]
    [ { THROUGH }  { literal-2   }                                            ]
    [ [ { data-name-3 }  { THRU    }  { data-name-4 } ] ...                   ]
    [ [ { literal-3   }  { THROUGH }  { literal-4   } ]                       ]

    [                        ( SEQUENTIAL            ) ]
    [                        ( STANDARD              ) ]
    [  ORGANIZATION IS      <  DIRECT                 > ]
    [                        ( INDEXED SEQUENTIAL    ) ]
    [                        ( RELATIVE              ) ]

   [ACCESS MODE IS   { SEQUENTIAL } ]
   [                 { RANDOM     } ]

    [PROCESSING MODE IS SEQUENTIAL]
[ { ACTUAL   }  KEY IS data-name ]
[ { SYMBOLIC }                   ]

[NUMBER OF BLOCKS IS  { data-name } ]
[                     { integer   } ]

[ { INDEX-LEVEL IS   }  integer ]
[ { INDEX-LEVELS ARE }          ]

[INDEX-BLOCK CONTAINS integer RECORDS]

[RECORD-BLOCK CONTAINS integer  { RECORDS    } ]
[                               { CHARACTERS } ]

[INDEX-PADDING IS integer PERCENT]

[DATA-PADDING IS integer PERCENT] . } ...
```

format 1:

```
I-O-CONTROL.  COPY library-name

   [REPLACING  { literal-1    }   BY  { literal-2    }
   [           { word-1       }       { word-2       }
   [           { identifier-1 }       { identifier-2 }

                 [ { literal-3    }   BY  { literal-4    } ] ... ] .
                 [ { word-3       }       { word-4       } ]     ]
                 [ { identifier-3 }       { identifier-4 } ]     ]
```

format 2:

```
I-O CONTROL.
   [RERUN  [ON { file-name-1        } ]
   [           { implementor-name   } ]

               { { [END OF] { REEL } }                    }
        EVERY  { {          { UNIT } }  OF file-name-2    } ]
               { { integer-1 RECORDS }                    } ]
               { integer-2 CLOCK-UNITS                    } ]
               { condition-name                           } ]

   [SAME [{ SORT   }] AREA FOR file-name-1 {file-name-2} ... ]
   [     [{ RECORD }]                                        ]

   [MULTIPLE FILE TAPE CONTAINS file-name-1
         [POSITION integer-1]  [ file-name-2
         [POSITION integer-2] ]  ... ] .
```

PICTURE DESCRIPTION CODES

Data Characters

A	Alphabetic character
X	Alphanumeric character
9	Numeric character

Operation Symbols

S	Signed
V	Assumed decimal point location
P	Assumed decimal point scaling position

Replacement Characters

Z	Leading zeros replaced by blanks
*	Leading zeros replaced by * (check protection symbol)

Insertion Characters

$	Dollar sign; floating when more than one (dollar sign may be replaced by currency sign defined in SPECIAL-NAMES)
,	Comma
/	Slash (instead of comma)
.	Actual decimal point
B	Blank
0	Zero
-	Minus sign when item is negative, blank when positive; floating when more than one
+	Plus sign when item is positive, minus when negative; floating when more than one
CR	Credit symbol when item is negative, blank when positive
DB	Debit symbol when item is negative, blank when positive

DATA SPECIFICATIONS

	File Section			Common and Working Storage Sections				Constant Section			
	01	group	elem	77	01	group	elem	77	01	group	elem
REDEFINES	I										
SIZE			R	R			R	R			R
USAGE											
CLASS				R				R			
OCCURS	I			I	I			I	I		
POINT LOCATION	J	I			J	I			J	I	
SIGNED	J	I			J	I			J	I	
JUSTIFIED	J	I			J	I			J	I	
SYNCHRONIZED	J	I			J	I			J	I	
PICTURE	J	I			J	I			J	I	
Editing Clauses	J	I			J	I		I	J	I	I
COPY											
VALUE	K	K	C					V			V
FILLER	I			I	I			I	I		

C	Legal only in defining values for condition names
I	Illegal
R	Required if PICTURE is not used
blank	Optional
V	Required
J	Legal only on elementary 01 items
K	Documentary only

DATA DIVISION

```
DATA DIVISION.
[FILE SECTION.]
[COMMON-STORAGE SECTION.]
[WORKING-STORAGE SECTION.]
[SECONDARY-STORAGE SECTION.]
[CONSTANT SECTION.]
[LINKAGE SECTION.]
[REPORT SECTION.]
```

File Description Entry (File Section Only)

A Sort File Description (SD) entry may contain only DATA RECORD, RECORD CONTAINS, and FILE CONTAINS clauses; any or all may be omitted from an SD entry.

format 1:

```
{ SD }
{ FD } file-name COPY library-name

   [ REPLACING { literal-1    }  BY { literal-2    }
   [           { word-1       }     { word-2       }
   [           { identifier-1 }     { identifier-2 }

               [ { literal-3    }  BY { literal-4    } ] ... ] .
               [ { word-3       }     { word-4       } ]
               [ { identifier-3 }     { identifier-4 } ]
```

format 2:

```
{ SD }
{ FD } file-name

[ BLOCK CONTAINS [integer-1 TO] integer-2 { RECORDS    } ]
                                          { CHARACTERS } ]

{ [ DATA { RECORD IS    } data-name-1 [data-name-2] ... ] }
{        { RECORDS ARE  }                                 }
{                                                         }
{   { REPORT IS    } report-name-1 [report-name-2] ...    }
{   { REPORTS ARE  }                                      }

[FILE CONTAINS ABOUT integer RECORDS]
```

```
        { RECORDS ARE }  { STANDARD                            }
LABEL   { RECORD IS   }  { OMITTED                             }
                         { data-name-1 [data-name-2] ...       }

If label records are STANDARD:

[ VALUE OF [ { ID             } IS { literal-1   } ]
           [ { IDENTIFICATION }    { data-name-1 } ]

           [ DATE-WRITTEN IS { literal-2   } ]
           [                 { data-name-2 } ]

           [ EDITION-NUMBER IS { literal-3   } ]
           [                   { data-name-3 } ]

           [ REEL-NUMBER IS { literal-4   } ]
           [                { data-name-4 } ]

           [ RETENTION-CYCLE IS { literal-5   } ]  ]
           [                    { data-name-5 } ]  ]

If label records are a data-name:

[ VALUE OF data-name-3 IS { literal-1   }
                          { data-name-4 }

    [ data-name-5 IS { literal-2   } ]  ...  ]
    [                { data-name-6 } ]       ]

[ VALUE OF ENDING-TAPE-LABEL-IDENTIFIER

    IS { literal-3   } ]
       { data-name-7 } ]

[ LINAGE IS { integer    } LINES ]
            { identifier }

[ RECORD CONTAINS [integer-1 TO] integer-2 CHARACTERS

    [ DEPENDING ON { RECORD-MARK } ] ]
    [              { data-name-1 } ] ]

[                              [ { HIGH  }         ]]
[ RECORDING MODE IS [{ BINARY  }][ { LOW   } DENSITY ]]
[                   [{ DECIMAL }][ { HYPER }         ]]

[ SEQUENCED ON data-name-1 [data-name-2] ... ] .
```

Record Description Entry (File, Common-Storage, Working-Storage, Secondary-Storage, Constant and Linkage Sections)

format 1:

```
{ 01    }
{ 02-49 }  data-name  COPY library-name [FROM LIBRARY]

[ REPLACING { word-1       }  BY { word-2       }
            { identifier-1 }     { identifier-2 }
            { literal-1    }     { literal-2    }

     [ { word-3       }  BY { word-4       } ]      ]
     [ { identifier-3 }     { identifier-4 } ]  ... ] .
     [ { literal-3    }     { literal-4    } ]      ]
```

format 2:

```
level-number data-name-1  [REDEFINES identifier]
     COPY data-name-2 FROM SOURCE.
```

format 3:

```
level-number { data-name [REDEFINES identifier] }
             { FILLER                           }

[ { BWZ               } ] .
[ { BLANK WHEN ZERO   } ]

[ { CHECK PROTECT        }                              ]
[ { FLOAT DOLLAR SIGN    }  [LEAVING integer PLACES]    ]
[ { FLOAT CURRENCY SIGN  }                              ]
[ { ZERO SUPPRESS        }                              ]

[               { ALPHABETIC   } ]
[ [CLASS IS]    { NUMERIC      } ]
[               { ALPHANUMERIC } ]
[               { AN           } ]

[ { JUST      } RIGHT ]
[ { JUSTIFIED }       ]
[ OCCURS integer-1 [TO integer-2] TIMES
    [DEPENDING ON data-name-1]
    [ { ASCENDING  } KEY IS data-name-2 [data-name-3] ... ]
    [ { DESCENDING }                                      ]
    [INDEXED BY index-name-1 [index-name-2] ...]            ]

[ { PIC     } IS character-string ]
[ { PICTURE }                     ]

[ POINT LOCATION IS { LEFT  } integer PLACES ]
[                   { RIGHT }                ]

[ RANGE IS literal-1 { THRU    } literal-2 ]
[                    { THROUGH }           ]

[ { SIGNED            } ]
[ { SIGN IS data-name } ]

[ SIZE IS integer [ { CHARACTERS } ] ]
[                 [ { DIGITS     } ] ]

[ { SYNC         } { LEFT  } ]
[ { SYNCHRONIZED } { RIGHT } ]

[              { COMP             } ]
[              { COMPUTATIONAL    } ]
[              { COMP-1           } ]
[ [USAGE IS]   { COMPUTATIONAL-1  } ]
[              { COMP-2           } ]
[              { COMPUTATIONAL-2  } ]
[              { DISPLAY          } ]
[              { INDEX            } ]

[VALUE IS literal].
```

format 4:

```
66 data-name RENAMES identifier-1 [ { THRU    } identifier-2 ].
                                  [ { THROUGH }              ]
```

format 5:

```
88 condition-name { VALUE IS   } literal-1
                  { VALUES ARE }

  [ { THRU    } literal-2 ] [ literal-3 [ { THRU    } literal-4 ] ... ] .
  [ { THROUGH }           ] [           [ { THROUGH }           ]     ]
```

Report Description Entry (Report Section Only)

format 1:

```
RD report-name [WITH CODE mnemonic-name]

                       ┌           ⎧ literal-1    ⎫
COPY library-name      │ REPLACING ⎨ word-1       ⎬ BY
                       └           ⎩ identifier-1 ⎭

   ⎧ literal-2    ⎫ ┌┌⎧ literal-3    ⎫    ⎧ literal-4    ⎫┐     ┐
   ⎨ word-2       ⎬ ││⎨ word-3       ⎬ BY ⎨ word-4       ⎬│ ... │ .
   ⎩ identifier-2 ⎭ └└⎩ identifier-3 ⎭    ⎩ identifier-4 ⎭┘     ┘
```

format 2:

```
RD report-name [WITH CODE mnemonic-name]

┌                      ⎧ identifier-1 [identifier-2] ...       ⎫ ┐
│ ⎧ CONTROL IS    ⎫    ⎨ FINAL                                 ⎬ │
│ ⎩ CONTROLS ARE  ⎭    ⎩ FINAL identifier-1 [identifier-2] ... ⎭ │
└                                                                ┘

┌ PAGE ⎧ LIMIT IS   ⎫ integer-1 ⎧ LINE  ⎫              ┐
│      ⎩ LIMITS ARE ⎭           ⎩ LINES ⎭              │
│                                                      │
│   [HEADING integer-2]  [FIRST DETAIL integer-3]      │
│                                                      │
└   [LAST DETAIL integer-4 [FOOTING integer-5]         ┘ .
```

Report Group Description Entry (Report Section Only)

format 1:

```
01 [data-name] COPY library-name [FROM LIBRARY]

┌              ⎧ literal-1    ⎫      ⎧ literal-2    ⎫
│  REPLACING   ⎨ word-1       ⎬  BY  ⎨ word-2       ⎬
└              ⎩ identifier-1 ⎭      ⎩ identifier-2 ⎭

            ┌⎧ literal-3    ⎫      ⎧ literal-4    ⎫┐      ┐
            │⎨ word-3       ⎬  BY  ⎨ word-4       ⎬│ ...  │ .
            └⎩ identifier-3 ⎭      ⎩ identifier-4 ⎭┘      ┘
```

format 2:

```
01 data-name-1 [REDEFINES identifier]
     COPY data-name-2 FROM SOURCE.
```

format 3:

```
01 [data-name]

[                    ( ALPHABETIC     )  ]
[  [CLASS IS]        ) NUMERIC        (  ]
[                    ) ALPHANUMERIC   (  ]
[                    ( AN             )  ]

[                    ( integer-1          )  ]
[  LINE NUMBER IS   <  PLUS integer-2     >  ]
[                    ( NEXT PAGE          )  ]

[                    ( integer-1          )  ]
[  NEXT GROUP IS    <  PLUS integer-2     >  ]
[                    ( NEXT PAGE          )  ]

[  SIZE IS integer  { CHARACTERS }  ]
[                   { DIGITS     }  ]

                 / REPORT HEADING                                          \
                 | RH                                                      |
                 | PAGE HEADING                                            |
                 | PH                                                      |
                 | OVERFLOW HEADING                                        |
                 | OH                                                      |
                 |  { CONTROL HEADING }   { identifier-1 }                 |
                 |  { CH              }   { FINAL        }                 |
                 | DETAIL                                                  |
TYPE IS         <  DE                                                      >
                 |  { CONTROL FOOTING }   { identifier-2 }                 |
                 |  { CF              }   { FINAL        }                 |
                 | OVERFLOW FOOTING                                        |
                 | OV                                                      |
                 | PAGE FOOTING                                            |
                 | PF                                                      |
                 | REPORT FOOTING                                          |
                 \ RF                                                      /

[  [USAGE IS] DISPLAY  ]
```

Report Element Description (Report Section Only)

```
level-number [data-name]

[ { BLANK WHEN ZERO }  ]
[ { BWZ            }  ]

[ { CHECK PROTECT       }                                 ]
[ { FLOAT DOLLAR SIGN   }                                 ]
[ { FLOAT CURRENCY SIGN }  [LEAVING integer PLACES]       ]
[ { ZERO SUPPRESS       }                                 ]

[               { ALPHABETIC   } ]
[ [CLASS IS]    { NUMERIC      } ]
[               { ALPHANUMERIC } ]
[               { AN           } ]

[COLUMN NUMBER IS integer]

[GROUP INDICATE]

[ { JUSTIFIED }  RIGHT ]
[ { JUST      }        ]

[                  { integer-1      } ]
[ LINE NUMBER IS   { PLUS integer-2 } ]
[                  { NEXT PAGE      } ]

[ { PIC     }  IS character-string ]
[ { PICTURE }                      ]

[ POINT LOCATION IS { LEFT  }  integer PLACES ]
[                   { RIGHT }                 ]

[ RESET ON { identifier } ]
[          { FINAL      } ]

[ { SIGNED               } ]
[ { SIGN IS data-name    } ]

[ SIZE IS integer   { CHARACTERS } ]
[                   { DIGITS     } ]
```

$$\left\{\begin{array}{l} \underline{\text{SOURCE}}\ \text{IS} \left\{\begin{array}{l}[\underline{\text{SELECTED}}]\ \text{identifier}\\ \underline{\text{LINE-COUNTER}}\\ \underline{\text{PAGE-COUNTER}}\\ \underline{\text{TODAYS-DATE}}\end{array}\right\} \\ \underline{\text{SUM}}\ \text{identifier-1}\,[\text{identifier-2}]\ \ldots\ [\underline{\text{UPON}}\ \text{data-name}] \\ \underline{\text{VALUE}}\ \text{IS literal}\end{array}\right\}$$

$[[\underline{\text{USAGE}}\ \text{IS}]\ \underline{\text{DISPLAY}}].$

$\underline{\text{TYPE}}$ clause allowed if level 01

$\underline{\text{NEXT}}\ \underline{\text{GROUP}}$ clause allowed if level 01

USAGE SPECIFICATIONS

Element	Upper Limit
data-name	30 characters, 5 levels of qualifications
elementary item/literal	255 characters/digits
PERFORM nesting	15 levels in separate overlays, no limit in main overlay
level numbers	01-49, 66, 77, 88, FD, RD, SD
OCCURS...DEPENDING ON	1 per record description
library copies	5 levels of nesting
ACCEPT items	80 characters; 40 characters from console
PICTURE clause	30 symbols
arithmetic operand	18 digits
GO TO statement	100 procedure names
ALTER statement	100 procedure names
DISPLAY items	no limit
ENTER parameters	no limit
Total files, I/O devices, and reports	53
Total procedure names	depends on field length
Total external references	depends on field length

VALID MOVE OPERATIONS

Source Field \ Rec. Field	Elem. Binary	Elem. Alpha	Elem. BCD Num.	Elem. AN	Elem. Edit Num.	Elem. Edit AN	Group AN
Elem. Binary	Num. Bin.	X	Conv. Num.	Conv.† AN	Conv. Edit	Conv.† AN-Edit	TD AN
Elem. Alpha	X	AN	TD AN	AN	X	AN-Edit	AN
Elem. BCD Num.	Conv. Bin.	TD AN	Num.	AN†	Edit	AN-Edit	AN†
Elem. AN	X	TD AN	Num.	AN	Edit	AN-Edit	AN
Elem. Edit Num.	X	TD AN	X	AN	X	AN-Edit	AN
Elem. Edit AN	X	TD AN	X	AN	X	AN-Edit	AN
Group AN	TD AN	TD AN	TD AN	AN	X	AN-Edit	AN
Group Binary & Mixed	TD AN	TD AN	TD AN	TD AN	X	TD AN-Edit	TD AN
Zero	Num. Bin.	X	Num.	AN	Edit	AN-Edit	AN
Literal & Fig. Cons. AN	X	TD AN	X	AN	X	AN-Edit	AN
Literal Num.	Conv. Bin.	X	Num.	AN†	Edit	AN-Edit	AN

† Valid only when source is integer; others TD.

Any move to a binary or mixed group is treated as an alphanumeric move; a precautionary diagnostic is issued.

A move to a figurative constant or literal is illegal.

X	Illegal
AN	Alphanumeric
AN-Edit	Alphanumeric edited
Conv.	Conversion prior to move
Edit	Numeric edited
Num.	Numeric
Num. Bin.	Numeric binary
TD	Trivial diagnostic issued

PROCEDURE DIVISION

```
PROCEDURE DIVISION. [USING parameter-list] .

┌ DECLARATIVES.                                                  ┐
│                                                                │
│  { section-name SECTION.  declarative-sentence.                │
│                                                                │
│  { paragraph name.  { sentence. }  ... }  ... }  ...           │
│                                                                │
└ END DECLARATIVES.                                              ┘

   { section-name SECTION [priority-number] .

   { paragraph-name.    { sentence. }  ... }  ... }  ...

                         ┌        ( TIME              ) ┐
ACCEPT identifier        │ FROM  <  DATE              > │
                         │        ( DAY               ) │
                         └          mnemonic-name       ┘

ADD  { identifier-1 }   [ { identifier-2 } ]  ...
     { literal-1    }   [ { literal-2    } ]

      identifier-3 [ROUNDED]

      [ON SIZE ERROR imperative-statement]

ADD  { identifier-1 }    [ { identifier-2 } ]   ... TO
     { literal-1    }    [ { literal-2    } ]

      identifier-3 [ROUNDED] [identifier-4 [ROUNDED] ] ...

      [ON SIZE ERROR imperative-statement]

ADD  { identifier-1 }    { identifier-2 }    [ { identifier-3 } ]   ...
     { literal-1    }    { literal-2    }    [ { literal-3    } ]

      GIVING identifier-4 [ROUNDED]  [identifier-5 [ROUNDED] ] ...

      [ON SIZE ERROR imperative-statement]

ADD  { CORR          }  identifier-1
     { CORRESPONDING }

      TO identifier-2 [ROUNDED]  [identifier-3 [ROUNDED] ] ...

      [ON SIZE ERROR imperative-statement]
```

```
ALTER procedure-name-1 TO [PROCEED TO] procedure-name-2

      [procedure-name-3 TO [PROCEED TO] procedure-name-4] ...

CALL  {routine-name}  [USING identifier-1 [identifier-2] ...] .

CLOSE file-name-1   [{ UNIT }]    [ WITH { NO REWIND } ]
                    [{ REEL }]    [      { LOCK      } ]

     [ file-name-2  [{ UNIT }]    [ WITH { NO REWIND } ] ]
     [              [{ REEL }]    [      { LOCK      } ] ] ...

COMPUTE identifier-1 [ROUNDED] [identifier-2 [ROUNDED]] ...

      { FROM   } { literal                }
      { =      } { arithmetic-expression  }
      { EQUALS } { identifier-3           }

      [ON SIZE ERROR imperative-statement]

{ COPY    }  library-name [FROM LIBRARY]
{ INCLUDE }

     [ REPLACING  { literal-1    }   BY  { literal-2    }
     [            { word-1       }       { word-2       }
     [            { identifier-1 }       { identifier-2 }

                 [{ literal-3    }   BY  { literal-4    }]     ]
                 [{ word-3       }       { word-4       }] ... ] .
                 [{ identifier-3 }       { identifier-4 }]     ]

DELETE RECORD FROM file-name

      [INVALID KEY imperative-statement]

DISPLAY { identifier-1 }     [{ identifier-2 }]   ...
        { literal-1    }     [{ literal-2    }]

      [UPON mnemonic-name]

DIVIDE { identifier-1 }  INTO identifier-2 [ROUNDED]
       { literal      }

      [identifier-3 [ROUNDED]] ...

      [ON SIZE ERROR imperative-statement]
```

```
DIVIDE  { identifier-1 }  { BY   }  { identifier-2 }
        { literal-1    }  { INTO }  { literal-2    }

     GIVING identifier-3 [ROUNDED]  [identifier-4 [ROUNDED]] ...

     [ON SIZE ERROR imperative-statement]

DIVIDE  { identifier-1 }  { BY   }  { identifier-2 }
        { literal-1    }  { INTO }  { literal-2    }

     GIVING identifier-3 [ROUNDED]

     REMAINDER identifier-4

     [ON SIZE ERROR imperative-statement]

ENTER [language-name] routine-name [USING parameter-list].

ENTER COBOL.

ENTER LINKAGE.

{ ENTER }
{ CALL  }  [language-name] routine-name  [USING parameter-list] .

ENTRY routine-name [USING parameter-list].

EXAMINE identifier

{  TALLYING  { ALL         }  literal-1                          }
{            { LEADING     }    [REPLACING BY literal-2]         }
{            { UNTIL FIRST }                                     }
{                                                                }
{  REPLACING  { ALL           }  literal-3 BY literal-4          }
{             { LEADING       }                                  }
{             { [UNTIL] FIRST }                                  }

EXIT.

{ EXIT PROGRAM. }
{ RETURN.       }

GENERATE identifier

GO TO [procedure-name]

GO TO procedure-name-1 [procedure-name-2 ...]

     DEPENDING ON identifier
```

$$\underline{\text{IF}}\ \text{conditional-expression}\ [\underline{\text{THEN}}]\ \left\{\begin{array}{l}\text{statement-1}\\ \underline{\text{NEXT}}\ \underline{\text{SENTENCE}}\end{array}\right\}$$

$$[\underline{\text{THEN}}]\ \left\{\begin{array}{l}\underline{\text{OTHERWISE}}\\ \underline{\text{ELSE}}\end{array}\right\}\ \left\{\begin{array}{l}\text{statement-2}\\ \underline{\text{NEXT}}\ \underline{\text{SENTENCE}}\end{array}\right\}$$

Conditional expressions include:

$$\left\{\begin{array}{l}\text{identifier-1}\\ \text{literal-1}\\ \text{formula-1}\end{array}\right\} \left\{\begin{array}{l}\text{IS }[\underline{\text{NOT}}]\left\{\begin{array}{l}\underline{\text{GREATER}}\ \text{THAN}\\ \underline{\text{GR}}\\ \underline{>}\\ \underline{\text{LESS}}\ \text{THAN}\\ \underline{\text{LS}}\\ \underline{<}\\ \underline{\text{GREATER-EQUAL}}\ \text{TO}\\ \underline{\text{GQ}}\\ \underline{\text{LESS-EQUAL}}\ \text{TO}\\ \underline{\text{LQ}}\\ \underline{\text{EQUAL}}\ [\underline{\text{TO}}]\\ \underline{\text{EQ}}\\ \underline{=}\end{array}\right\}\\ \\ \text{IS }\underline{\text{UNEQUAL}}\ \text{TO}\\ \underline{\text{EQUALS}}\\ \underline{\text{EXCEEDS}}\\ \text{IS }\underline{\text{NQ}}\\ \text{IS }\underline{\text{NGR}}\\ \text{IS }\underline{\text{NLS}}\end{array}\right\} \left\{\begin{array}{l}\text{identifier-2}\\ \text{literal-2}\\ \text{formula-2}\end{array}\right\}$$

$$\left\{\begin{array}{l}\text{identifier}\\ \text{formula}\end{array}\right\}\ \text{IS }[\underline{\text{NOT}}]\ \left\{\begin{array}{l}\underline{\text{POSITIVE}}\\ \underline{\text{NEGATIVE}}\\ \underline{\text{ZERO}}\end{array}\right\}$$

$$\text{identifier IS }[\underline{\text{NOT}}]\ \left\{\begin{array}{l}\underline{\text{NUMERIC}}\\ \underline{\text{ALPHABETIC}}\end{array}\right\}$$

$$[\underline{\text{NOT}}]\ \left\{\begin{array}{l}\text{condition-name}\\ \text{switch-status-name}\end{array}\right\}$$

$$\underline{\text{INITIATE}}\ \left\{\begin{array}{l}\text{report-name-1 [report-name-2]} \ldots\\ \underline{\text{ALL}}\end{array}\right\}$$

$$\underline{\text{MOVE}}\ \left\{\begin{array}{l}\left\{\begin{array}{l}\underline{\text{CORR}}\\ \underline{\text{CORRESPONDING}}\end{array}\right\}\ \text{identifier-1}\\ \text{literal-1}\\ \text{identifier-1}\end{array}\right\}\ \underline{\text{TO}}$$

$$\text{identifier-2[identifier-3]} \ \ldots$$

```
MULTIPLY { identifier-1 }  BY identifier-2 [ROUNDED]
         { literal      }

    [identifier-3 [ROUNDED] ] ...

    [ON SIZE ERROR imperative-statement]

MULTIPLY { identifier-1 }  BY  { identifier-2 }
         { literal-1    }      { literal-2    }

    GIVING identifier-3 [ROUNDED]

    [identifier-4 [ROUNDED] ] ...

    [ON SIZE ERROR imperative-statement]

NOTE character-string.

      / EXTEND file-name-1 [file-name-2] ...                              \
      |                                                                   |
      | INPUT file-name-1    [ { REVERSED          } ]                    |
      |                      [ { WITH NO REWIND    } ]                    |
      |                                                                   |
      |      [ file-name-2   [ { REVERSED          } ] ] ...              |
OPEN <       [               [ { WITH NO REWIND    } ] ]                   >
      |                                                                   |
      | OUTPUT file-name-1    [WITH NO REWIND                             |
      |        [file-name-2   [WITH NO REWIND] ] ...                      |
      |                                                                   |
      | { INPUT-OUTPUT }  file-name-1 [file-name-2] ...                   |
      \ { I-O          }                                                  /

PERFORM procedure-name-1 [ { THRU    }  procedure-name-2]
                           { THROUGH }

PERFORM procedure-name-1 [ { THRU    }  procedure-name-2]
                           { THROUGH }

    { identifier }  TIMES
    { integer    }

PERFORM procedure-name-1 [ { THRU    }  procedure-name-2]
                           { THROUGH }

    UNTIL condition
```

```
PERFORM procedure-name-1 [ { THRU    } procedure-name-2]
                           { THROUGH }

                                         { literal-1      }
   VARYING { index-name-1 }  FROM { index-name-2 }  BY
           { identifier-1 }              { identifier-2   }

  { literal-2    }                        [ AFTER { index-name-3 }
  { identifier-3 } UNTIL condition-1      [       { identifier-4 }

         { literal-3    }
   FROM  { index-name-4 }  BY { literal-4    }  UNTIL condition-2
         { identifier-5 }     { identifier-6 }

                                             { literal-5    }
  [ AFTER { index-name-5 }  FROM { index-name-6 }  BY
  [       { identifier-7 }       { identifier-8 }

  { literal-6    }  UNTIL condition-3 ] ]
  { identifier-9 }

READ file-name RECORD [INTO identifier]  AT END

      imperative-statement

READ file-name RECORD [INTO identifier]

      [MAJOR KEY IS data-name] INVALID KEY imperative-statement

RELEASE record-name [FROM identifier]

RETURN file-name RECORD [INTO identifier]  AT END

      imperative-statement

REWRITE record-name [FROM identifier]

      [INVALID KEY imperative-statement]

SEARCH identifier-1 [ VARYING { index-name   } ]
                    [         { identifier-2 } ]

      [AT END imperative-statement-1]

      WHEN condition-1 { imperative-statement-2 }
                       { NEXT SENTENCE          }

      [ WHEN condition-2 { imperative-statement-3 } ] ...
      [                  { NEXT SENTENCE          } ]
```

```
SEARCH ALL identifier [AT END imperative-statement-1]

     WHEN condition  { imperative-statement-2 }
                     { NEXT SENTENCE          }

SEEK file-name RECORD [WITH KEY CONVERSION]

SET  { index-name-1  [index-name-2] ... }
     { identifier-1  [identifier-2] ... }

     TO  { index-name-3 }
         { identifier-3 }
         { literal      }

SET index-name-1 [index-name-2] ...

     { UP BY   }  { identifier }
     { DOWN BY }  { literal    }

SKIP  { literal   }  RECORDS ON file-name
      { data-name }

SORT file-name-1 ON  { DESCENDING }
                     { ASCENDING  }

     KEY data-name-1 [data-name-2] ...

     [ ON  { DESCENDING }  KEY data-name-3 [data-name-4] ... ] ...
           { ASCENDING  }

     { INPUT PROCEDURE IS section-name-1                   }
     {                                                     }
     {   [ { THRU    }  section-name-2 ]                   }
     {     { THROUGH }                                     }
     { USING file-name-2                                   }

     { OUTPUT PROCEDURE IS section-name-3                  }
     {                                                     }
     {   [ { THRU    }  section-name-4 ]                   }
     {     { THROUGH }                                     }
     { GIVING file-name-3                                  }

STOP  { literal }
      { RUN     }
```

```
SUBTRACT { identifier-1 }    [ { identifier-2 } ]  ...
         { literal-1    }    [ { literal-2    } ]

     FROM identifier-3

     [ROUNDED] [identifier-4[ROUNDED]] ...

     [ON SIZE ERROR imperative-statement]

SUBTRACT { identifier-1 }    [ { identifier-2 } ]  ...
         { literal-1    }    [ { literal-2    } ]

     FROM { identifier-3 }
          { literal-3    }

     GIVING identifier-4 [ROUNDED]

     [identifier-5 [ROUNDED]] ...

     [ON SIZE ERROR imperative-statement]

SUBTRACT { CORR          } identifier-1 FROM
         { CORRESPONDING }

     identifier-2 [ROUNDED]  [identifier-3 [ROUNDED]] ...

     [ON SIZE ERROR imperative-statement].

TERMINATE { report-name-1 [report-name-2] ... }
          { ALL                               }

USE AFTER STANDARD ERROR PROCEDURE ON

     { file-name-1 [file-name-2] ... }
     { INPUT                         }
     { OUTPUT                        }
     { INPUT-OUTPUT                  }
     { I-O                           }

USE { BEFORE } STANDARD   [ { BEGINNING } ]
    { AFTER  }            [ { ENDING    } ]

      [ { REEL } ]
      [ { FILE } ]
      [ { UNIT } ]

                                { file-name-1[file-name-2] ... }
                                { INPUT                        }
LABEL { PROCEDURE  }   ON       { OUTPUT                       }
      { PROCEDURES }            { INPUT-OUTPUT                 }
                                { I-O                          }
```

```
USE BEFORE REPORTING identifier-1 [identifier-2] ...

                     { ALL                              }
USE FOR HASHING ON   { file-name-1 [file-name-2] ...    }

                           { ALL                              }
USE FOR DUPLICATE KEY ON   { file-name-1 [file-name-2] ...    }

                              { ALL                              }
USE FOR KEY CONVERSION ON     { file-name-1 [file-name-2] ...    }

WRITE record-name [FROM identifier-1]

      [ { BEFORE }               { identifier-2 LINES }  ]
      [ { AFTER  }   ADVANCING   { integer LINES      }  ]
      [                          { mnemonic-name      }  ]

      [ AT { END-OF-PAGE }  imperative-statement ]
      [    { EOP         }                       ]

WRITE record-name [FROM identifier]

      [INVALID KEY imperative-statement]
```

COBOL CONTROL CARD

Parameters are used to select compilation options. All are optional and may be specified in any order. Each is separated from the other by a comma. The list may be enclosed in parentheses (as shown) or it may be separated from the word COBOL by a comma and terminated by a period.

```
COBOL.                        [comments]
COBOL (parameter-list)
```

A (Blank Conversion)	A	treats leading blanks as zeros
B (Binary Output)	absent B B = LGO	relocatable binary file on file LGO
	B = fn	binary output on file fn
	B = 0	suppress binary output
BUF (Buffer Size)	BUF	selects buffer size by method of version 3.0 COBOL
C (Copy Default)	C	uses version 3.0 COPY mode; to copy from library, FROM LIBRARY must be specified
D (Execution Abort)	D	prevents execution of program if E diagnostic occurs
E (EDITLIB)	E = fn	using EDITLIB, add object code to system library
F (Computational Modification)	F	interprets COMPUTATIONAL items as COMPUTATIONAL-1
H (BCOMMON)	H	BCOMMON replaces blank common as buffer area
I (Source Input)	absent I I = INPUT	INPUT assumed
	I = fn	source input on file fn

L (List)	absent L	normal listing on OUTPUT
	LX	extended diagnostics
	LR	cross reference pointers
	LC	copy from library
	LO	object code in octal
	LM	data map
	L = fn	output on file fn
	L = 0	suppress list output
N (Non-ANSI Diagnostic)	N	diagnoses any non-ANSI feature
O (Compiler Options)	O = X	extended diagnostics
	O = R	cross reference pointers
	O = O	object code in octal
	O = C	copy from library
	O = M	data map
OB (Overlay Binary)	OB OB = LGO2	binary output on LGO2
	OB = fn	binary output from overlay segments put on file fn
OL (Optimizer Level)	OL = 0	no optimizations
	OL = 1	program flow optimization
	OL = 2	machine instruction optimization
	OL = 3 absent OL	all optimizations

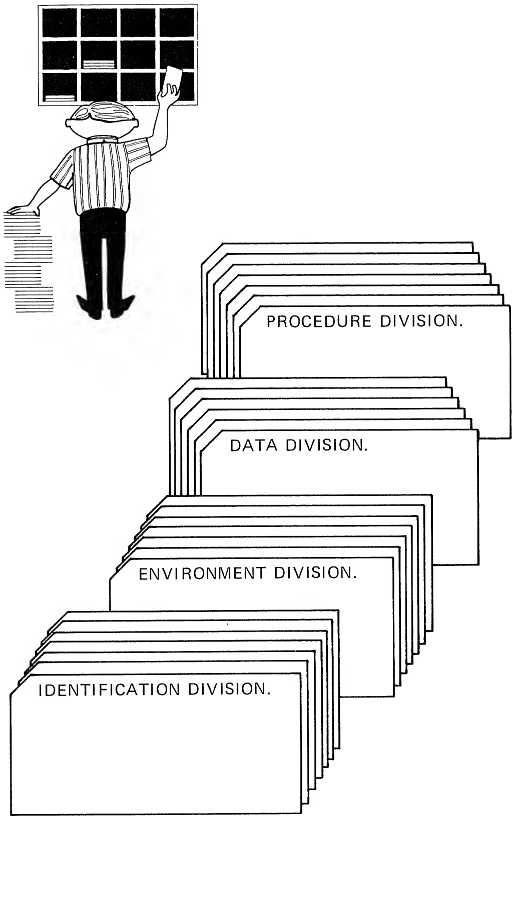
P (ANSI execution)	P	allows non-ANSI reserved words; selects N parameter
S (Source Library)	absent S S = COLIB	source library from file COLIB
	S = fn	from file fn
SUB (Subcompile)	SUB	suppresses all data division binary output except from working and constant storage
T (Tape Sort)	T	sort requests tape sort
U (ASCII Collating)	U	use ASCII collating sequence
W (Initialize Overlays)	W	uses version 3.0 method of treating independent segments: they are available in last used state
Z (3.0 Compatibility)	Z	provides compatibility with version 3.0 COBOL: selects parameters BUF, C, and W

COBOL CODING FORMAT

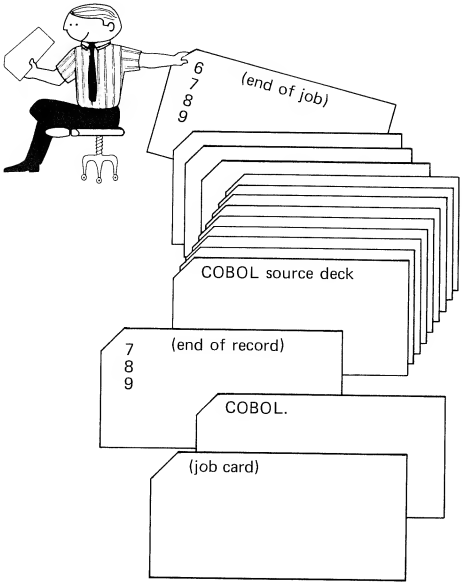
Column	Element
1 – 6	Sequence number
7	Hyphen, slash, or asterisk
8	Division name Section name Paragraph name File description Record description level number
12	Record description data name First sentence of a paragraph File name Continuation of a data description or a sentence
73 – 80	Identification (optional)

Sequence number	Optional, checked by the processor if used
Hyphen	Indicates continuation of a word or literal from the preceding line
Slash or asterisk	Remainder of line is treated as comment and skips to new page
Division name	Terminated by period, remainder of line is blank
Section name	Followed by optional priority number, terminated by period, remainder is blank
Paragraph name	Terminated by period, and followed by at least one blank before text begins
File Description	FD or SD followed by file name and at least one blank
Record Description	Level number followed by at least one blank and data name
First Sentence	Begins in or after column 12. Spaces may be used freely to avoid splitting a word or literal. If a word or literal is split, a hyphen must appear in column 7 of the next line.

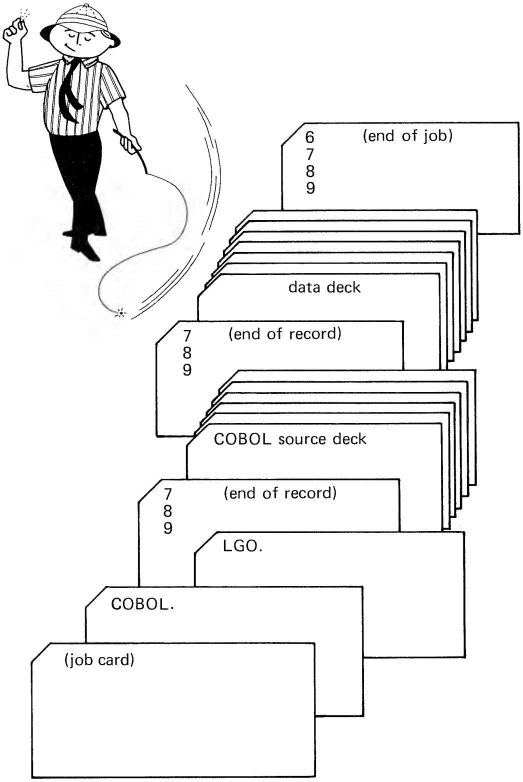
COBOL SOURCE DECKS



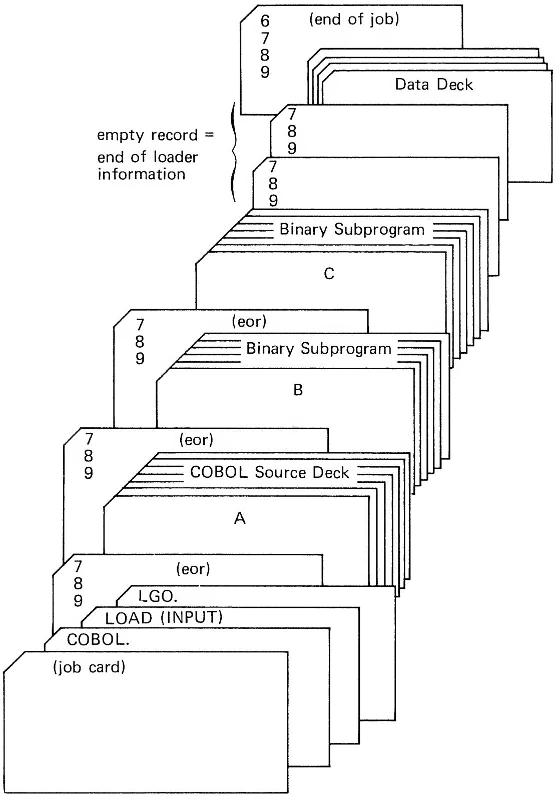
COBOL COMPILATION



EXECUTION


6
7
8
9
(end of job)
data deck
7
8
9
(end of record)
COBOL source deck
7
8
9
(end of record)
LGO.
COBOL.
(job card)

EXECUTION WITH SEGMENTATION



COBOL RESERVED WORD LIST

***Indicates word not implemented.**

ABOUT
ACCEPT
ACCESS
ACTUAL
ADD
*ADDRESS
ADVANCING
AFTER
ALL
ALPHABETIC
ALPHANUMERIC
ALTER
ALTERNATE
AN
AND
*ANSIB
*APPLY
ARE
AREA
AREAS
ASCENDING
ASSIGN
AT
AUTHOR

*BCD
BEFORE
BEGINNING
BEGINNING-FILE-LABEL
BEGINNING-TAPE-LABEL
BINARY
*BITS
BLANK
BLOCK
BLOCKS
BWZ
BY

CALL
CANCEL
*CD
CF
CH
CHARACTER
CHARACTERS
CHECK
CLASS
CLOCK-UNITS
CLOSE
COBOL
CODE
COLUMN
COMMA
COMMON-STORAGE
COMP
COMP-1
COMP-2
COMPASS
COMPUTATIONAL
COMPUTATIONAL-1
COMPUTATIONAL-2
COMPUTE
CONFIGURATION
CONSOLE
CONSTANT
CONTAINS
CONTROL
CONTROLS
CONVERSION
COPY
CORR
CORRESPONDING
*COUNT
CREATE
CURRENCY

DATA
DATA-PADDING
DATE
DATE-COMPILED
DATE-WRITTEN
DAY
DE
DECIMAL
DECIMAL-POINT
DECLARATIVES
DELETE
*DELIMITER
*DELIMITED

DENSITY
DEPENDING
*DEPTH
DESCENDING
*DESTINATION
DETAIL
DIGIT
DIGITS
DIRECT
*DISABLE
DISPLAY
DIVIDE
DIVIDED
DIVISION
DOLLAR
DOWN
DUPLICATE

EBCDIC
EDITION-NUMBER
ELSE
*EMI
*ENABLE
END
END--OF-PAGE
ENDING
ENDING-FILE-LABEL
ENDING-TAPE-LABEL
ENDING-TAPE-LABEL-IDENTIFIER
ENTER
ENTRY
ENVIRONMENT
EOP
EQ
EQUAL
EQUALS
ERROR
ERROR-CODE
*ESI
*ETI
EVERY
EXAMINE
EXCEEDS
EXIT
EXPONENTIATED
EXTEND
*EXTERNAL

FD
FILE
FILE-CONTROL
FILE-LABEL
FILE-LIMIT
FILE-LIMITS
FILLER
FINAL
*FIND
FIRST
FLOAT
FOOTING
FOR
*FORMAT
*FORTRAN
FORTRAN-R
FORTRAN-X
FROM

GENERATE
GIVING
GO
GQ
GR
GREATER
GREATER-EQUAL
GROUP

*HASHED
HASHED-VALUE
HASHING
HEADING
HIGH
HIGH-VALUE
HIGH-VALUES
*HOLD
HYPER

ID
IDENTIFICATION
IF
IN
INCLUDE
INDEX

INDEX-BLOCK
INDEX-LEVEL
INDEX-LEVELS
INDEX-PADDING
INDEXED
INDICATE
INITIATE
INPUT
INPUT-OUTPUT
INSTALLATION
INTO
INVALID
I-O
I-O-CONTROL
IS

JUST
JUSTIFIED

KEY
KEYS

LABEL
LAST
LEADING
LEAVING
LEFT
LESS
LESS-EQUAL
LIBRARY
LIMIT
LIMITS
LINAGE
LINAGE-COUNTER
LINE
LINE-COUNTER
LINES
LINKAGE
LOCATION
LOCK
LOW
LOW-VALUE
LOW-VALUES
*LOWER-BOUND
*LOWER-BOUNDS
LQ
LS

MAJOR
MEMORY
*MESSAGE
MINUS
MODE
MODULES
MOVE
MULTIPLE
MULTIPLIED
MULTIPLY

NEGATIVE
NEXT
NGR
NLS
NO
NOT
NOTE
NQ
NUMBER
NUMERIC

OBJECT-COMPUTER
OCCURS
OF
OFF
OH
OMITTED
ON
OPEN
OPTIONAL
OR
ORGANIZATION
OTHERWISE
OUTPUT
OV
OVERFLOW
*OWNER

PAGE
PAGE-COUNTER
PERCENT
PERFORM
PF
PH
PIC
PICTURE
PLACES
PLUS
POINT
POSITION
POSITIVE
*PREPARED
*PRINT-SWITCH
PRIORITY
PROCEDURE
PROCEDURES
PROCEED
*PROCESS
PROCESSING
PROGRAM
PROGRAM-ID
PROTECT

*QUEUE
QUOTE
QUOTES

RANDOM
RANGE
RD
READ
*RECEIVE
RECORD
RECORD-BLOCK
RECORD-MARK
RECORDING
RECORDS
REDEFINES
REEL
REEL-NUMBER
*REFERENCES
RELATIVE
RELEASE
REMAINDER
REMARKS
RENAMES
RENAMING
REPLACING
REPORT
REPORTING
REPORTS
RERUN
RESERVE
RESET
RETENTION
RETENTION-CYCLE
RETURN
REVERSED
REWIND
REWRITE
RF
RH
RIGHT
ROUNDED
RUN

*SA
SAME
SD
SEARCH
SECONDARY-STORAGE
SECTION
SECURITY
SEEK
SEGMENT-LIMIT
SELECT
SELECTED
*SEND
SENTENCE
SEQUENCED
SEQUENTIAL
SET
SIGN
SIGNED
SIZE
SKIP
SORT
SOURCE
SOURCE-COMPUTER

SPACE
SPACES
SPECIAL-NAMES
STANDARD
STATUS
STOP
*STRING
*SUB-QUEUE-1
*SUB-QUEUE-2
*SUB-QUEUE-3
SUBTRACT
SUM
*SUPERVISOR
SUPPRESS
SWITCH
SYMBOLIC
SYNC
SYNCHRONIZED

*TABLE
TALLY
TALLYING
TAPE
TERMINAL
TERMINATE
*TEST
*TEXT
THAN
THEN
THROUGH
THRU
TIME
TIMES
TO
TODAYS-DATE
TYPE

UNEQUAL
UNIT
*UNSTRING
UNTIL
UP
UPON
*UPPER-BOUND
*UPPER-BOUNDS
USAGE
USE
USING

VALUE
VALUES
VARYING
*VOLUME

WHEN
WITH
*WORDS
WORKING-STORAGE
WRITE

ZERO
ZEROES
ZEROS

64-CHARACTER SET COLLATING SEQUENCE

Collating Sequence	COBOL Character	Display Code	Hollerith Punch (026)	Hollerith Punch (029)
00	blank	55	no punch	no punch
01	≤*	74	8-5	12-8-4
02	%	63	8-6	0-8-4
03	[*	61	8-7	8-5
04	→*	65	0-8-5	0-8-5
05	≡*	60	0-8-6	8-3
06	∧*	67	0-8-7	12
07	↑*	70	11-8-5	8-4
08	↓*	71	11-8-6	0-8-7
09	>	73	11-8-7	0-8-6
10	≥*	75	12-8-5	0-8-2
11	¬*	76	12-8-6	11-8-7
12	.	57	12-8-3	12-8-3
13	)	52	12-8-4	11-8-5
14	;	77	12-8-7	11-8-6
15	+	45	12	12-8-6
16	$	53	11-8-3	11-8-3
17	*	47	11-8-4	11-8-4
18	-	46	11	11
19	/	50	0-1	0-1
20	,	56	0-8-3	0-8-3
21	(	51	0-8-4	12-8-5
22	=	54	8-3	8-6
23	≠†	64	8-4	8-7
24	<	72	12-0	12-8-2
25	A	01	12-1	12-1
26	B	02	12-2	12-2
27	C	03	12-3	12-3
28	D	04	12-4	12-4
29	E	05	12-5	12-5
30	F	06	12-6	12-6
31	G	07	12-7	12-7

*Not in COBOL character set; may be present in data

†COBOL quote character (") is output on printer as ≠

64-CHARACTER SET COLLATING SEQUENCE (continued)

Collating Sequence	COBOL Character	Display Code	Hollerith Punch	
			(026)	(029)
32	H	10	12-8	12-8
33	I	11	12-9	12-9
34	V	66	11-0	11-8-2
35	J	12	11-1	11-1
36	K	13	11-2	11-2
37	L	14	11-3	11-3
38	M	15	11-4	11-4
39	N	16	11-5	11-5
40	O	17	11-6	11-6
41	P	20	11-7	11-7
42	Q	21	11-8	11-8
43	R	22	11-9	11-9
44	]††	62	0-8-2	12-8-7
45	S	23	0-2	0-2
46	T	24	0-3	0-3
47	U	25	0-4	0-4
48	V	26	0-5	0-5
49	W	27	0-6	0-6
50	X	30	0-7	0-7
51	Y	31	0-8	0-8
52	Z	32	0-9	0-9
53	:*	00	8-2	8-2
54	0	33	0	0
55	1	34	1	1
56	2	35	2	2
57	3	36	3	3
58	4	37	4	4
59	5	40	5	5
60	6	41	6	6
61	7	42	7	7
62	8	43	8	8
63	9	44	9	9

*Not in COBOL character set

††COBOL record mark

ASCII COLLATING SEQUENCE

Collating Sequence	Character	Display Code	Hollerith Punch (026)	Hollerith Punch (029)
00	blank	55	no punch	no punch
01	!*	62	0-8-2	12-8-7
02	"	64	8-4	8-7
03	#	60	0-8-6	8-3
04	$	53	11-8-3	11-8-3
05	%	63	8-6	0-8-4
06	&	67	0-8-7	12
07	'	61	8-7	8-5
08	(	51	0-8-4	12-8-5
09	)	52	12-8-4	11-8-5
10	*	47	11-8-4	11-8-4
11	+	45	12	12-8-6
12	,	56	0-8-3	0-8-3
13	-	46	11	11
14	.	57	12-8-3	12-8-3
15	/	50	0-1	0-1
16	0	33	0	0
17	1	34	1	1
18	2	35	2	2
19	3	36	3	3
20	4	37	4	4
21	5	40	5	5
22	6	41	6	6
23	7	42	7	7
24	8	43	8	8
25	9	44	9	9
26	:	00	8-2	8-2
27	;	77	12-8-7	11-8-6
28	<	74	8-5	12-8-4
29	=	54	8-3	8-6
30	>	73	11-8-7	0-8-6
31	?	71	11-8-6	0-8-7

ASCII COLLATING SEQUENCE (continued)

Collating Sequence	Character	Display Code	Hollerith Punch (026)		Hollerith Punch (029)
32	@	70	11-8-5		8-4
33	A	01	12-1		12-1
34	B	02	12-2		12-2
35	C	03	12-3		12-3
36	D	04	12-4		12-4
37	E	05	12-5		12-5
38	F	06	12-6		12-6
39	G	07	12-7		12-7
40	H	10	12-8		12-8
41	I	11	12-9		12-9
42	J	12	11-1		11-1
43	K	13	11-2		11-2
44	L	14	11-3		11-3
45	M	15	11-4		11-4
46	N	16	11-5		11-5
47	O	17	11-6		11-6
48	P	20	11-7		11-7
49	Q	21	11-8		11-8
50	R	22	11-9		11-9
51	S	23	0-2		0-2
52	T	24	0-3		0-3
53	U	25	0-4		0-4
54	V	26	0-5		0-5
55	W	27	0-6		0-6
56	X	30	0-7		0-7
57	Y	31	0-8		0-8
58	Z	32	0-9		0-9
59	[	72	12-0	or	12-8-2
60	/	75	12-8-5		0-8-2
61	]	66	11-0	or	11-8-2
62	︿	76	12-8-6		11-8-7
63	—	65	0-8-5		0-8-5

63-CHARACTER SET COLLATING SEQUENCE

Collating Sequence	COBOL Character	Display Code	Hollerith Punch (026)	Hollerith Punch (029)
00	blank	55	no punch	no punch
01	≤*	74	8-5	12-8-4
02	[*	61	8-7	0-8-4
03	→*	65	0-8-5	0-8-5
04	≡*	60	0-8-6	8-3
05	∧*	67	0-8-7	12
06	↑*	70	11-8-5	8-4
07	↓*	71	11-8-6	0-8-7
08	>	73	11-8-7	0-8-6
09	≥*	75	12-8-5	0-8-2
10	¬*	76	12-8-6	11-8-7
11	.	57	12-8-3	12-8-3
12	)	52	12-8-4	11-8-5
13	;	77	12-8-7	11-8-6
14	+	45	12	12-8-6
15	$	53	11-8-3	11-8-3
16	*	47	11-8-4	11-8-4
17	–	46	11	11
18	/	50	0-1	0-1
19	,	56	0-8-3	0-8-3
20	(	51	0-8-4	12-8-5
21	=	54	8-3	8-6
22	≠†	64	8-4	8-7
23	<	72	12-0	12-8-2
24	A	01	12-1	12-1
25	B	02	12-2	12-2
26	C	03	12-3	12-3
27	D	04	12-4	12-4
28	E	05	12-5	12-5
29	F	06	12-6	12-6
30	G	07	12-7	12-7
31	H	10	12-8	12-8

*Not in COBOL character set; may be present in data
†COBOL quote character (") is output on printer as ≠

63-CHARACTER SET COLLATING SEQUENCE (continued)

Collating Sequence	COBOL Character	Display Code	Hollerith Punch (026)	(029)
32	I	11	12-9	12-9
33	∨	66	11-0	11-8-2
34	J	12	11-1	11-1
35	K	13	11-2	11-2
36	L	14	11-3	11-3
37	M	15	11-4	11-4
38	N	16	11-5	11-5
39	O	17	11-6	11-6
40	P	20	11-7	11-7
41	Q	50	11-8	11-8
42	R	22	11-9	11-9
43	]††	62	0-8-2	12-8-7
44	S	23	0-2	0-2
45	T	24	0-3	0-3
46	U	25	0-4	0-4
47	V	26	0-5	0-5
48	W	27	0-6	0-6
49	X	30	0-7	0-7
50	Y	31	0-8	0-8
51	Z	32	0-9	0-9
52	:*	63	8-2	8-2
53	0	33	0	0
54	1	34	1	1
55	2	35	2	2
56	3	36	3	3
57	4	37	4	4
58	5	40	5	5
59	6	41	6	6
60	7	42	7	7
61	8	43	8	8
62	9	4	9	9

*Not in COBOL character set
††COBOL record mark

NOTES

CONTROL DATA
CORPORATION

Pub. No. 60328400 Litho in U.S.A.